Naif Arab University for Security Sciences
Arab Journal of Forensic Sciences & Forensic Medicine
المجلة العربية لعلوم الأدلة الجنائية والطب الشرعي
https://journals.nauss.edu.sa/index.php/AJFSFM

Study of Fatal Firearm Cases in Allahabad Region, India

دراسة حالات الأسلحة النارية القاتلة في منطقة الله أباد

Archana Kaul [1], Rahat Faraz [*2], Rai Rajesh [1], Sonkar V. K [1]

[1] Department of Forensic Medicine and Toxicology, MotiLal Nehru Medical College, Allahabad, Uttar-Pradesh, India.
[2,*] Department of Forensic Medicine and Toxicology, Autonomous State Medical College, Behraich, Uttar-Pradesh, India.

Received 20 Aug. 2018; Accepted 27 Apr. 2020; Online 15 Jun. 2020.

Abstract

This study was done to assess the pattern of firearm injuries in Allahabad amongst medicolegal autopsies in the mortuary of Swaroop Rani Nehru Hospital, MotiLal Nehru Medical College, India. It was a descriptive study including fatal cases of firearm injury which underwent autopsy from 1st of January 2015 to 30th July 2016.

The demographic information regarding the victims was obtained from the inquest report, person accompanying the victim, their friends and relatives. Autopsy reports were also used to gather additional information. Parameters studied included age and sex of the victim, site of firearm injury and manner of death.

In our study, out of 4,445 autopsies, 63 were cases of firearm injury. From these cases, 58 were homicidal, 3 were suicidal, and 1 was accidental. The results show that the age group most commonly affected was 31-40 years (26.98%). Male to female ratio was 6.9:1. The most common targeted part of the body was the chest (61.0%).

Keywords: *Forensic Science, Fatal Firearm Injuries, Homicide, Accident, Suicide, Autopsy*

المستخلص

كان اكتشاف النار نعمة عظيمة للحضارة الإنسانية، ولكن مع اختراع الأسلحة النارية، تغيرت هذه النعمة إلى لعنة للبشرية جمعاء. تم إجراء هذه الدراسة البحثية لتقييم نمط إصابات الأسلحة النارية في منطقة الله أباد بين تشريح الجثث الطبية في مشرحة مستشفى سواروب راني نهرو، كلية موتيال نهرو الطبية.

كانت دراسة وصفية بما في ذلك الحالات القاتلة لإصابة سلاح ناري التي خضعت للتشريح من 1 يناير 2015 إلى 30 يوليو 2016. تم الحصول على المعلومات الديموغرافية المتعلقة بالضحايا من تقرير التحقيق والأشخاص المرافقين للضحية وأصدقائهم وأقارب الضحية. كما تم استخدام الورقة الخاصة بجمع المعلومات وفحص التشريح. المعايير التي تمت دراستها هي عمر الضحية وجنسها، وموقع الإصابة بالأسلحة النارية وطريقة الوفاة.

في هذه الدراسة، وجد أنه من بين 4445 عملية تشريح، كانت 63 حالة إصابة بسلاح ناري، ومن بين هؤلاء، كان 58 قتيلاً و3 ماتوا انتحاراً وحالة واحدة كانت موت عرضي.

أظهرت النتائج أن الفئة العمرية الأكثر تأثراً هي التي أعمارها تتراوح ما بين 31-40 عامًا (26.98٪). وكانت نسبة الذكور إلى الإناث 6.9: 1. الجزء الأكثر شيوعا كمكان مستهدف من الجسم هي منطقة الصدر (61.0 ٪).

الكلمات المفتاحية: علم الأدلة الجنائية، الطب الشرعي، إصابات سلاح ناري قاتلة، القتل، الحوادث، الانتحار، تشريح الجثة.

* Corresponding Author: Rahat Faraz
Email: farazdr81@gmail.com

doi: 10.26735/HKWO6585

1. Introduction

In most parts of the world, firearm injuries are the second leading cause of death among the young population, after road traffic accidents [1]. The incidences of gunshot injuries are becoming increasingly common, and this reflects the frequency with which law and order situation in the society have been compromised. In 2014, in low and middle-income countries, the rate of deaths due to violence was more than twice of that in high-income countries [2]. According to recent statistical data from the National Crime Report Bureau, the number of victims murdered by firearms during 2014 in India were 3,655, out of which 540 were killed by licensed firearms and 3,115 by unlicensed firearms. Three of the nation's most economically depressed states, Uttar Pradesh, Bihar, and Jharkhand, account for two-thirds of the nation's incidents [3]. Firearm injuries not only contribute to high mortality rates but also lead to a huge burden of morbidity, long-term disabilities (both physical and psychological) for individuals, families, and societies at large [4]. Relevant studies and information in this area are lacking in Allahabad. The objective of this study is to outline the pattern of firearms injuries and determine the cause of death caused by firearms in the study area.

2. Materials and Methods

This retrospective study included all cases of firearm fatalities presented to the mortuary of the SRN Hospital, M.L.N. Medical College, Allahabad, India from 1st of January 2015 to 30th July 2016. A total of 4,445 autopsies were done during the study period of which 63 cases showed fatal firearm injuries. Our study attempted to describe the age and sex of each victim, site of firearm injury, and manner of death. For the purpose of the study, a predesigned and pretested questionnaire was used to collect the relevant data.

These data were collected from the following sources:

- Inquest reports and other connected papers
- Interviews of the persons who brought the victim to the hospital
- Interviews of the friends and relatives of the victim
- Autopsy reports

The observed data was entered onto a worksheet and analyzed using Microsoft Excel Word 2007.

3. Results

During the study period, a total of 4,445 autopsies were done in the mortuary of SRN Hospital, M.L.N. Medical College, Allahabad. From these cases, 63 were due to fatal firearm injuries and were included in the study.

Table-1 shows the distribution of age and sex of these 63 cases. The most commonly affected age group was found to be 31-40 years (26.98%), and the age group least commonly affected was 61-70 years (4.76%).

The frequency of involvement of various body parts in firearm injuries is described in Table-2. In the majority of victims (61.90%), the location of entry wound was on the chest followed by multiple body parts (25.39%), abdomen (20.63%), head (20.63%), back (11.11%), upper extremity (7.93%), face and neck (4.76%).

Manner of death in various firearm fatalities is shown in Table-3. Homicide accounted for the maximum number of cases, 58, (92.06%), followed by suicide 3 (4.76%) and accident (1.58%). In 1 (1.58%) case, the manner of death was not known.

Table 1- *Distribution of firearm injury cases according to the age and gender.*

Age group (years)	Male	Female	Number	Percentage
11 – 20	6	1	7	11.11%
21 – 30	11	4	15	23.80%
31 – 40	17	2	18	26.98%
41 – 50	13	1	14	22.22%
51 – 60	5	0	5	7.93%
61 – 70	3	0	3	4.76%
TOTAL	*n* = 55	*n*= 8	*n*= 63	100%

Table 2- *The frequency of involvement of various body parts in firearm injuries.*

Site of entry wound	Number of victims	Percentage
Head	13	20.63%
Face & Neck	3	4.76%
Back	7	11.11%
Chest	39	61.90%
Abdomen	13	20.63%
Upper extremity	5	7.93%
Lower extremity	1	1.58%
Multiple body parts	16	25.39%

Table 3- *Manner of death involved in various firearm fatalities.*

Manner	Number of cases	Percentage
Homicide	58	92.06%
Suicide	3	4.76%
Accident	1	1.58%
Not known	1	1.58%
Total	63	100%

4. Discussion

Firearms are one of the most lethal weapons in society. The use of firearms is increasing worldwide and Allahabad is no exception to this.

Age distribution of victims of fatal firearm injuries in our study showed that the majority (52.38%) were young adults in the age group of 21-40 years. Fourteen (22.22%) of victims were middle aged, 41-50 yrs. Eight (12.69%) of victims were of old age, 51 years and above. Similarly, Khetran et al. [13] found the most common affected age group in Baluchistan was 31-40 yrs (61.94%), and Mirza et al. [19] found that the majority of victims were in the age group of 16-30 years (50.52%). In India, Vithalrao et al. [5] observed that the most affected age group in the Varanasi region was 21-40 years (66.65%).

In our study, it is observed that males (87.30%) were the majority of vicitms in fatal firearm incidents; only 8 victims (12.69%) were female. The majority of victims (52.38%) were young adults in the age group of 21-40 years. Victims in the middle aged group 41-50 yrs constituted 22.22% of total firearm fatalities, while the age group 11-20 years comprised 11.11%. Only 12.69% of victims were of old age, 51 years and above.

The preponderance of males over females in firearm fatalities has been consistently reported from all over the world. Similar results were observed by Mirza et al. [19] and other studies in this region by Kumari et al. [12]. Vithalrao et al. [5] also confirmed the male preponderance in cases of firearm fatalities. The cause of male preponderance can be understood, as males are supposed to bear the financial responsibilities of the family in our society while females are still the main homemakers. Therefore, males are exposed to a greater risk of disputes, bad habits, enmity, and outdoor violence.

The present study of fatal firearm injuries revealed that out of the total 4,445 autopsies done during the study period, 1.41% cases were because of fatal firearm injuries. Similarly, a study conducted by Vithalrao et al.[5] in Varanasi region found that 1.52% of the victims had died due to fatal firearm injury. However, a study of criminal homicides in Houston [6] revealed that shooting accounted for 63.5% of autopsied cases. Another study conducted by Hussain et al. [7] in Peshawar revealed that out of 492 homicidal deaths, a large majority of 452 deaths (91.87%) were caused by firearm injuries. Edirisinghe [8] found that the homicidal fatal firearm injuries in the western province of Sri Lanka constituted 31% of all the autopsies done. In India, Kumar et al.[9] studied 486 homicidal deaths during a period of 1 year in Varanasi of which 88 cases (18.10%) were due to firearms. Pradip Kumar et al. [10] concluded that in Imphal, around 31.62% homicidal deaths were due to firearm injury. Khan et al. [11] conducted a research in Aligarh and recorded 198 deaths due to fatal firearm injury. Kumari et al. [12] reported 240 firearm deaths in Agra region, out of all the total autopsies performed.

In our study, the most common part of the body injured was the chest (61.0%) followed by multiple body parts,

including the abdomen, head, back, upper extremity, face and neck. Similarly, Khetran et al. [13] in Baluchistan reported that the most common target site was the chest and abdomen. Edirisinghe et al. [8] in Srilanka reported that most common targeted site was either the head or chest. In India, Das Gupta [14], Nabachandra et al. [15], Potwary [16], Kohli [17], and Vithalrao et al. [5] also observed that in the majority of victims, the site of the entry wound was the chest. Husain et al. [16] in Peshawar observed that extremity was the most common targeted site. Seleye et al. [18] and Mirza et al. [19] in Karachi showed that the head was the most frequently targeted site of the body.

In the present study, it was found that homicide accounted for the maximum number of cases (92.06%) of fatal firearm injury followed by suicide and accidents. Similarily, Solarino et al. [20] in Italy, Khetran et al. [13] in Baluchistan, Amiri et al. [21], and Kohli et al. [17] reported that the majority of cases of firearm fatalities were homicidal. However, a study conducted in the USA by Lemaire et al. [22] on firearm fatalities found more use of firearms in suicidal cases. In some western countries, fatal firearm injuries are the commonest cause of suicides and homicides, because of the easy availability and lawful acquisition of firearms for self defence. However, in countries like India, homicide accounts for the maximum number of cases, because legal guns mostly belong to rich people, while for criminal intent, unlawful and country made firearms are cheaper options.

5. Conclusion

This study has provided significant information concerning the prevalence of fatal firearm injuries and pattern. The study clearly showed that almost 50% of the victims belonged to the age group of 20-40 years and that homicide was the most common manner of death. Therefore, more efforts are needed to prevent the occurrence of such cases.

The following steps should be of help in its prevention:

1) Youth should be provided with appropriate employment facilities.
2) Keep a check to maintain proper law and order in the society.
3) Strict laws should be implemented to control the use of unlicensed arms.
4) Need to eliminate illegal gun making units in our region in order to decrease the rate of firearm fatalities.

Various law enforcing agencies must make more efforts and be more vigilant on this account, in order to accomplish these goals.

Acknowledgement
Author is extremely thankful to all those who helped and guided in the successful completion of the study.

Conflict of interest
None

Source of funding
Nill

Ethical Clearance
The study was approved by the Institutional Ethics Committee

References

1. Sing RF, Branas CC, MacKenzie EJ, Schwab CW. Geographic variation in serious nonfatal firearm injuries in Pennsylvania. J Trauma Acute Care Surg. 1997;43(5):825-30. https://doi.org/10.1097/00005373-199711000-00015
2. NCRB.nic.in.Person killed in firearm injury and in other injuries. 2015.
3. Crime in India, Compendium. National Crime Records Bureau Ministry of Home Affairs Government of India, 2014. http://www.ncrb.gov.in/StatPublications/CII/CII2014/Compendium%202014.pdf
4. Richardson JD, Davidson D, Miller FB. After the shooting stops: follow-up on victims of an assault rifle attack. J Trauma. 1996; 41(5):789-93. https://doi.org/10.1097/00005373-199611000-00004
5. K. S. Vithalrao, N. Chaurasia Dr. S. K. Pandey. An Analysis of Trends of Fatal Firearm Casualities in Medicolegal Autopsy in Varanasi Region (India). J Biol Agricult Healthcare. 2015; 5(3):71
6. OkornyAlex D. Human Violence: A Comparison of Homicide, Aggravated Assault, Suicide and Attempted Suicide. J Crim Law Criminol Police Sci.1965;56(4):488-497. https://doi.org/10.2307/1141678
7. ZahidHussain, MianMujahid Shah, Hakim Khan Afridi, Muhammad Arif Homicidal Deaths by Firearm in Peshawar: An Autopsy Study. J Ayub Med Coll, Abbottabad: JAMC. 2006;18(1):44-7.
8. Edirisinghe P.A.S, Kittulvatte G.D. Homicidal firearm injuries: A Study from Srilanka, I.G.D Forensic Sci Med Pathol. 2010;6:93. https://doi.org/10.1007/s12024-009-9139-z
9. Rajeev Kumar. "Medico-legal study of homicide by firearms and explosives". J Evol Med Dent Sci.

2013; 2 (44):8490-8507. https://doi.org/10.14260/jemds/1484
10. Pradipkumar KH, Marak FK, Keisham S, Phom M, Momonchand A. Homicidal fatal firearm injuries. J Indian acad forensic med. 2005;27(4):222-5.
11. Khan I, Shakeel M, Singh P, Usmani JA, Hasan SA. Trends in firearm injuries related to accidental causes: a study. JK Science. 2013;15(4):177.
12. Kumari S, Rajput A.S, Agarwal A, Arif A, Chaturvedi R K.Medicolegal aspects 0f firearm injury cases in Agra region, Indian acad forensic med. 2014;36(4): 387-390
13. Khetran A. K,Rehman S, Khan Z, Baloch M. R. Incidence of death due to gunshot injuries at District Barkhan, Balochistan, JLUMHS. 2012;11(2):90-92.
14. Das Gupta S.M., Subsahmayan, B.V.,Yadwad, B.S. and Kaviya, V.D. Trends in Homicide. J Indian Acad Forensic Sci.1979;18(1): 13.
15. Nabachandra H. Study of Homicide Firearm Injuries in Medicolegal Autopsies. Thesis submitted for the degree of Doctor of Medicine in Forensic Medicine, Institute of Medical Sciences, B.H.U., Varanasi, IIJFMT. 1984. 2(2):2004.
16. A.J. Patowary.Study of Pattern of Injuries in Homicidal Firearm Injury Cases. J Indian acad forensic med. 2005;27(2): 92-95.
17. Anil Kohli,Aggarwal NK, Firearm fatalities in Delhi, India. Leg Med. 2006;8(5):264-8. https://doi.org/10.1016/j.legalmed.2006.06.001
18. D.Seleye-Fubara, E Bob-Yellowe, E.N. Etebu, Pathology of Firearm mortalities in the Niger Delta region of Nigeria: A study of 136 consecutive autopsies. Med Sci Law. 2009:49(1):51-5. https://doi.org/10.1258/rsmmsl.49.1.51
19. Mirza F, Khan A W, Mallick L, Mallick M, Parveen K. An Autopsy based study of pattern of firearm injuries in Karachi Pakistan. Emerg Med. 2013;3(6)
20. BiagioSolarino et al. Fatal Firearm Wounds: A retrospective study in Bari (Italy) between 1988 and 2003, Forensic Sci Int. 2007;168: 95-101. https://doi.org/10.1016/j.forsciint.2007.01.023
21. Amiri A, Sanaei-Zadeh H, TowfighiZavarei H, RezvaniArdestani F, Savoji N. Firearm fatalities: A preliminary study report from Iran. J Clin Forensic Med. 2003;10,(3):159-63. https://doi.org/10.1016/S1353-1131(03)00082-8
22. Lemaire J. The cost of firearm deaths in the United States: reduced life expectancies and increased insurance costs. J Risk Ins. 2005;72(3):359-74. https://doi.org/10.1111/j.1539-6975.2005.00128.x